

SINC - LINK

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SINC LINK

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PRESIDENT'S MESSAGE

I tallied up the number of LARKEN Disk Drives in our club and found that seven persons have purchased this system. In addition I know of two more 2068 owners who are actively contemplating purchase. This is noteworthy, since it would appear there are more Larken systems in the club than all other systems combined.

I view the proliferation of Disk Systems in the 2068 world with considerable dismay. Just how many systems can an orphan computer really support. This makes it somewhat gratifying to see that the LARKEN system has gained such a substantial following in our club.

Aside from problems of ongoing maintenance of the hardware, there should be concerns about the software support that will be available for it. A Disk System that has a substantial user base is bound to be beneficial to each owner, since more ideas and software will be developed, modified and shared by the users.

I propose to establish a Special Interest Group within the club to coordinate the activities of the users of this System. The scope of this group would have to be established by the SIG members themselves. Peter Hacksel and myself have discussed several possibilities in this area, and Peter has proposed to assume the primary role in this SIG. Current or potential new owners are invited to contact me to determine the level of interest in such an activity.

(P.S. After four months of use I think that my review of the system in the Vol. 4, Iss. 1 issue of our newsletter is still valid; if you are contemplating purchase of a Disk system, read it (or consult with an owner) see if this is the system for you.)

Yours in computing, George Chambers

TS 2068 NOTICE

One of our out-of-town members has designed and built an I/O board for the 2068. It has 8 TTL inputs and 8 TTL outputs; plugs into the cartridge slot, and has a 12 inch cable with a DIP socket.

He wonders if there is sufficient member interest to warrant producing them for sale at \$35/\$40 each. If you are interested, would you write to: Eric Michaud, 1269 Andrew Court, Sarnia, Ont., N7V 4H4.

George Chambers.

STAR PERFORMER

by Mel Richardson

David Wood of SiriusWare has written a word processor capable of truly serious writing on the T/S 1000 or ZX81 with a full-size keyboard. WORD* easily formats page size, length, tabs, paragraphs and text width. All print control codes are imbedded in the text, transparent to the printing function. And what functions! Insert, Delete, Find, Replace, Copy, Move and others all executed with simple and logical keypunches. Text is saved as data blocks and can be concatenated with other data blocks from tape.

In it's latest version, the program operates in slow or fast mode and in fast is impossible to overtype, even at page flips, which are blindingly fast.

WORD* is configured to the 2040 printer and generates a beautifully clear and balanced type face for this small unit.

For another \$15 David will provide a "Personality Module" that customizes the processor to your full-size printer.

WORD* and the Personality Module for my system can access all the functions of a Mannesmann MT80 printer including it's many type styles and also incorporate QSAVE.

Nothing is perfect. The program can lock up with some mistakes, but the versatility of WORD* makes this problem have small significance that grows less with experience.

With a 12 page manual and David Wood's outstanding after sale support, this is a quality product.

WORD* for T/S 1000 and ZX81
Personality Module \$15 U.S. ea.

SiriusWare
6 Turning Mill Road
Lexington, MA 02173

SINCEBITS

Ian Robertson
Compuserve 72167,3401
FIDO Net 148/Node 608

UPDATES: STOP THE PRESSES!!! Sir Olive has just perfected the 80. Thats right folks, the 80, which stands for the Quantum Dump which is exactly what he just did with Sinclair Research. It has been sold to Amstrad for a paltry \$7,300,000.00 (US). This is the figure quoted in the "Wall Street Journal". One of my large concerns now is "don't tell me that I have ANOTHER orphan computer with the Spectrum +!!! We will have to wait and see if Sears will be carrying "Sinclair/Amstrad" instead of just Amstrad. It appears that FIREBIRD will not be using LENSLOCK again, after the poor reception it received when used with their program "ELITE". I have seen several complaints in UK magazines concerning the inability to use LENSLOCK at all. Some users had tried a dozen times or more to load the program, but to no avail. The latest sad-news-item concerns the Spectrum 128. It seems the 128 will not load quite a few of the latest "top 10" games. Seems Sinclair made a few changes to the operating system without notifying the software houses. Not very professional Sir O. (Alan Sugar of Amstrad would not have done that). The software people are in the process of revising the programs to run on both the 48k and the 128k Spectrums.

T/S MAGAZINES: It is about time someone commented on the present state of "our" computer literature. First, let's look at the U.K. market - (1) YOUR COMPUTER has almost dropped Sinclair related material and at the same time each issue gets thinner and thinner (as a matter of interest I stopped subscribing), (2) ZX COMPUTING has gone monthly with the March 26th issue (which I have not yet received) and is still my personal favourite due to its literate content, (3) SINCLAIR USER still has articles of substance, but is getting more games oriented with each issue, (4) YOUR SINCLAIR (formerly YOUR SPECTRUM) is now almost totally games oriented, including the most juvenile letters to the editors ever published (except for CRASH), they have to be read to be believed - and that includes the answers too, (5) CRASH is a 100 % games magazine and is not worth mentioning. Now lets take a look at our own shores! The commercial magazines are: (1) SYNCWARE NEWS, (2) SUM, (3) TIME DESIGNS and (4) TS-HORIZONS. Thomas W. Woods also publishes a couple of other specialized items, in addition to SYNCWARE NEWS. Anything Tom publishes is first rate, dependable and can be recommended. I personally think that ALL T/S publications have merit and should be given more attention by the T/S community. Of the many newsletters, published by local T/S groups I think that LIST (Long Island Sinclair Timex Group) has to be singled out for the consistency of their newsletter (even if some of the issues are almost illegible). The content is always first rate and there is usually lots of it. To cap it all off, they usually publish on time! Now there are many other excellent newsletters (including this one) that are to be congratulated for their ongoing contribution to the growth and interest in "our computers", but if one has to be used as an example, then LIST has to be my personal choice. There are two areas that seem to cause most of the problems for publications: (a) seriousness and originality of content, and (b) publishing within a "reasonable" time frame.

TS2068: Lots of GOOD news this time around. Zebra Systems, 78-06 Jamaica Ave., Woodhaven, NY 11421, (718) 296-2385, have the following items of interest: (1) OS-64, a 64 column operating system cartridge, (2) Z-Term-64 64 column Terminal Program, must have the OS-64 in the cartridge dock, to be used with the 2050 modem and 80 column printer, (3) 2050 modems (untested) for \$10.00 each or 3 for \$25.00 (requires software, power supply and case). While discussing the 2050 modem - telecommunication is not complete without LOADER V from Kurt A. Casby, 25 Battle Creek Court, St. Paul, MN 55119. This program sells for \$9.95 and allows the user to up/download Tasword files, auto-repeat dialing and access an additional 20 BBS telephone numbers. Version V also allows MSCRIPT files and has good documentation. If you are a previous registered LOADER IV owner, you can upgrade for \$3.00. A revised 2068 TECHNICAL MANUAL is available from Time Designs Magazine, 29722 Hult Rd., Colton, OR 97017, for \$25.00. TD is reported to have fixed all the "known" bugs that existed in the previous Timex version of this manual.

SPECTRUM: The big Spectrum item this time is the arrival of TASWORD 3. It, presently, is on microdrive cartridge only and therefore can only be used with microdrives. It has (up to) 128 columns, tabs, footers, headers and allows printing from drive (mailmerging, etc.). I have been using it for about three weeks now and can honestly say - "FAST, FAST, FAST and GREAT, GREAT, GREAT". There are two other contenders for the "New and Improved" word processor title. One is the WORD MANAGER, from OCP. Considering the (unusual) screen character set and the cryptic documentation, it is not a serious contender. The other one is THE WRITER from Softek, but they have not released it to date. It is, apparently, an update of "Spectral Writer", which comes bundled with the Rotronics Wafadrive. The Wafadrive version was, for some people, a serious rival for Tasword 2. Another serious piece of new software is SUPADRIVE. It is only of use/interest to a Microdrive user. It allows a cartridge to be formatted to 100-105k instead of the usual 88-92k. Now while this may not seem like a big difference, it allows two complete 48k programs to be put on one cartridge, and still have room for a data file or two. Tasword 3 and Supadrive are both available from TRANSFORM LTD., 24, WEST OAK, BECKENHAM, KENT BR3 2EZ, U.K.. I have, over the past two years, read many kind words about them which were written by customers. I have to agree with this opinion. They sent me TW3 right away with a note enclosed stating that Supadrive was not yet available, but would be sent upon receipt. It was in my mail approx. 5 days later. Hats off to another good supplier! They also take plastic.

TS1000/TS1500: Integrated Data Systems, 30 Brookmount Rd., Toronto M4L 3N1, telephone 416-699-6330 has TS1500's for sale at \$50.00 (Cdn) plus \$ 3.50 postage. This includes one free piece of software and is for a limited time only. This price is cheque or money order only, no plastic, and does not include PST. MULE ELECTRONICS, 444 Lincoln Blvd., Dept. 310, Venice, CA 90291, still has the TS1000 keyboard symbols for sale at \$7.95 (basic set) and \$5.00 for the shifted-function set. They also sell a kit, consisting of the basic set, instructions on hooking up a proper keyboard and instructions on how to add single-stroke keys and TS1000 schematic for \$11.95. They are adhesive backed.

There's lots of new stuff for the ZX81 hobbyist this month! Several issues back, I mentioned the LARKEN Disk system. Well, IT'S READY!!!

NEW ZX81/TS1000 DISK SYSTEM

The timing of this is rather interesting, since I've had my AERCO system for awhile and reviewed it (the AERCO) last issue. A couple weeks ago, I got a phone call from Larry Kenny (the man behind Larken Electronics), announcing that his controller & ZX/LDOS is now available. Although I haven't ordered mine yet, Larry gave me a thorough description of the system over the phone, so I'll try to relate the pertinent details accurately.

First, the address: LARKEN ELECTRONICS, R.R.#2, NAVAN, ONT., CANADA K4B 1H9.

The price? \$120.00 CAN + \$4.00 shipping for Canadian orders. U.S. customers pay U.S.\$95.00 + \$6.00 shipping.

That's right, for a lousy hundred of Uncle Sam's snackers, you've got a FDC and DOS for virtually HALF the price of either the AERCO or COMPUSA systems! This may fit the budget of many ZX enthusiasts who have been put off by the relatively steep prices for AERCO or COMPUSA systems.

What about the DOS?? Well, you may have been wondering why I'm so excited about the LARKEN when I already have an AERCO Disk system. The ZX-LDOS makes the AERCO DOS seem shamefully incomplete and primitive. It is, indeed somewhat more powerful than the COMPUSA DOS.

Larken's 2068/Spectrum DD system has been available for several months, and seems to have received almost universally good reviews, especially in terms of value per dollar (same price as ZX system). The ZX-LDOS provides commands identical to the 2068 version, with a single USR entry.

Commands include DIRECTORY, FORMAT, LOAD, SAVE, DELETE, COPY, EXIT, MOVE*, and BABBLOCKS* (I'm not dead sure about the last 2, as they are in an expanded version of the 2068 LDOS). PROGRAMS with variables, DATA (specified variables or arrays), and blocks of CODE may be saved and loaded.

Up to 54 files may be stored on one disk. The disk format is identical to the 2068 version, so CODE files saved on a 2068 may be loaded by a ZX81, or vice versa!!

The Directory is automatic, and disk space is allocated dynamically. If you DELETE a short program or file, a longer file saved next will fill in the short empty space, then continue in the next available space. Programs are auto-verified and recorded with a checksum. If a loaded file has a bad checksum, the DOS will try reloading the file 10 times before giving up.

The LARKEN controller card has 2K onboard buffer RAM mapped at 12K-14K, with the actual DOS in a 2K EPROM at 14K-16K. The Disk I/O port addresses don't conflict with any other hardware peripherals that I know of.

This all has me itching to get the Larken DOS and relegate the AERCO to my "second" computer. For little over \$100, I can upgrade to LDOS, since it is compatible with the DSDD drives and power supplies I already have for the AERCO.

XMODEM UPDATES

Since receiving my 2050 modem(s) from Dave Clifford Associates, I have had some fun accessing bulletin boards, and swapping text files with friends who use IBMs (there's no accounting for taste!) among other things, and have made some observations I'd like to share.

First, the modem seems to be prone to bus loading problems on certain machines. I tried using the modem on my main ZX81-based computer with JLO motherboard & fullsize keyboard, with little success. I couldn't get the modem to acknowledge any incoming signal.

The same modem, connected to a TS1500 worked fine immediately. It also worked fine on another unmodified ZX81 with a Hunter Board and Memotech 64K ram attached. I have heard other reports of the 2050 not working with ZX81s with fullsize keyboard wiring added. Comments, anyone??

That shielded ribbon cable and the ferrite beads all look suspicious to me. I have had previous "bad experiences" with ribbon cable hookups. My plan is to mount a small male edge connector right on the 2050 board at its' connector area, connected with short wirewrap jumpers. Then the modem card can (vertically) plug right into my JLO motherboard, eliminating the whole ribbon cable ordeal. I'll keep you posted on how this works.

A further noteworthy point is that although the 2050 modem and the JLO Video Upgrade don't directly conflict over port addresses, the JLO Video Board "A" seems to need additional decoding: running Mini XMODEM put sprites up on my screen! Speaking of port conflicts, the other big "no-no combo" is the JLO Video Upgrade and the AERCO CPI. The AERCO CPI and JLO fight directly over use of port 7F, so cannot be used together.

On the software side, I've made a few observations on Mini XMODEM 1.7. The manual I received claims to apply to both the 1.5 and 1.7 versions of Xmodem, however ambiguities seem to abound. First of all, the addresses given for changing word parameters are wrong. I found that the correct data addresses are 14790 in the "24X" version, and 31174 in the 16K version (Westridge), for setting data bits, stop & parity.

On experimenting with some XMODEM up/downloading, I discovered some interesting things. First, even if you have 64K RAM attached (thus theoretically about 47K available for downloading), the program will only download a 15K file. I plan to take a peek around with HOT Z to try and patch in a fix for this.

After downloading a 3.5K long ASCII text file from a friend's PC clone, I sent it back to him to verify our setup. The Mini XMODEM program didn't stop uploading at the end-of-file marker: it sent the entire file buffer (the desired 3.5K of text plus 11.5K of ASCII Back Spaces (!)). Further testing revealed that Mini Xmodem seems to send "all it's got", every time. This is wasteful of phone time.

ZX81 NEWS: MODEMS, continued

Another idiosyncrasy seems to be that no choice is provided for specifying ASCII or SINCLAIR codes when uploading a file. Exchanging XMODEM downloaded files is no problem. But when I simply received a text file in terminal mode (with SAVE TOGGLE on), and then uploaded it back to the sender, he received it as a SINCLAIR file. Rather unreadable on an IBM PC. These considerations aside, Mini XMODEM still impresses me as a powerful piece of communications software. I hope to relocate the low memory version to run at \$2000-\$2E00 instead of at \$3300-\$3F40, which conflicts with AERCO, COMPUSA, and LARKEN DOS's, and perhaps even write in a DOS access which would permit one to save a full buffer to disk without going offline.

If ANYONE has any related comments, answers, suggestions, questions, etc. relating to the Westridge 2050/ Mini Xmodem 1.7 aspects related above, please get in contact with me in care of the club. I'd really like to hear from you.

SILICON MOUNTAIN COMPUTERS

Fred Nachbaur has been hard at work writing some fancy software for the ZX81/TS1000 with the JLD VIDEO UPGRADE. Now available is JOBASIC: a relocatable 4K extended BASIC interpreter for use with the Video Upgrade. JOBASIC provides 64 column screens, 256*192 plot, draw, and circle commands, up to 256 UDGs plus 128 printable characters plus their inverses, 32 sprites, 15 colours, 32*192 colour resolution, full 2040 printer support. Fred is providing a service called JOBASIC EXCHANGE, an applications & programs forum for JOBASIC users.

Graphics fanciers: JO-MANDELBROT, a version of the program for plotting Mandelbrot Sets* so popular on the Amiga, is now available. (*See A.K. DEWDNEY, in SCIENTIFIC AMERICAN, AUG. 85.) A FRACTALS implementation has also been written for JOBASIC. Both these programs provide hi res graphics with 8 times the vertical colour resolution that can be attained on the 2048!

For more information about these programs, as well as several tape/disk versions of Memotext, including a 64 column screen version for the Video Upgrade, Video EPROM improvements, and several unique products for the ZX81, write to Fred Nachbaur, c/o SILICON MOUNTAIN COMPUTERS, MTN. STN. GROUP BOX 012, NELSON, BC, CANADA V1L 5P1.

Rather than give a more detailed description of JOBBASIC's capabilities, here are some 2040 screendumps from the DEMO program provided with JOBBASIC. Although they show the pixel definition of the screen, it's a shame you can't see the colours! See you next time.

[illegible]

As you see, you can even mix the standard and custom characters on the same screen. However, UDC's can only be printed in 32-col width. You need about 1-1/2K bytes of RAM space beyond \$B800 for these and the sprite tables.

You will usually use these for custom character sets, but there is no reason why you can't use them for other things, like,

[illegible]

— 200 —

1990 26

64
2005-2010

There is some very significant character in
the system, including:

100 100 100 100 100 100 100 100 100 100

[illegible]

You also have lots of symbols:

[illegible]

Call the Page 2 FOOTING: 0176

[illegible]

For example, To Return To normal Mode 1 video display:

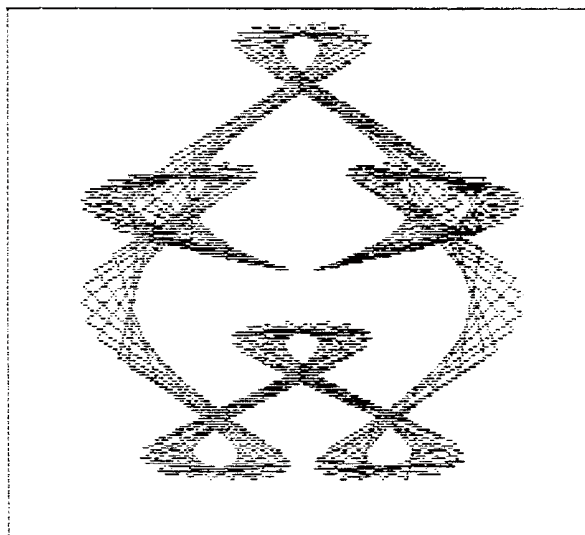
```
IF UGR NE THEN RETURN
```

1994 12 30 1995 01 01 1995 01 02 1995 01 03 1995 01 04 1995 01 05 1995 01 06 1995 01 07 1995 01 08 1995 01 09 1995 01 10 1995 01 11 1995 01 12 1995 01 13 1995 01 14 1995 01 15 1995 01 16 1995 01 17 1995 01 18 1995 01 19 1995 01 20 1995 01 21 1995 01 22 1995 01 23 1995 01 24 1995 01 25 1995 01 26 1995 01 27 1995 01 28 1995 01 29 1995 01 30 1995 01 31 1995 02 01 1995 02 02 1995 02 03 1995 02 04 1995 02 05 1995 02 06 1995 02 07 1995 02 08 1995 02 09 1995 02 10 1995 02 11 1995 02 12 1995 02 13 1995 02 14 1995 02 15 1995 02 16 1995 02 17 1995 02 18 1995 02 19 1995 02 20 1995 02 21 1995 02 22 1995 02 23 1995 02 24 1995 02 25 1995 02 26 1995 02 27 1995 02 28 1995 03 01 1995 03 02 1995 03 03 1995 03 04 1995 03 05 1995 03 06 1995 03 07 1995 03 08 1995 03 09 1995 03 10 1995 03 11 1995 03 12 1995 03 13 1995 03 14 1995 03 15 1995 03 16 1995 03 17 1995 03 18 1995 03 19 1995 03 20 1995 03 21 1995 03 22 1995 03 23 1995 03 24 1995 03 25 1995 03 26 1995 03 27 1995 03 28 1995 03 29 1995 03 30 1995 03 31 1995 04 01 1995 04 02 1995 04 03 1995 04 04 1995 04 05 1995 04 06 1995 04 07 1995 04 08 1995 04 09 1995 04 10 1995 04 11 1995 04 12 1995 04 13 1995 04 14 1995 04 15 1995 04 16 1995 04 17 1995 04 18 1995 04 19 1995 04 20 1995 04 21 1995 04 22 1995 04 23 1995 04 24 1995 04 25 1995 04 26 1995 04 27 1995 04 28 1995 04 29 1995 04 30 1995 05 01 1995 05 02 1995 05 03 1995 05 04 1995 05 05 1995 05 06 1995 05 07 1995 05 08 1995 05 09 1995 05 10 1995 05 11 1995 05 12 1995 05 13 1995 05 14 1995 05 15 1995 05 16 1995 05 17 1995 05 18 1995 05 19 1995 05 20 1995 05 21 1995 05 22 1995 05 23 1995 05 24 1995 05 25 1995 05 26 1995 05 27 1995 05 28 1995 05 29 1995 05 30 1995 05 31 1995 06 01 1995 06 02 1995 06 03 1995 06 04 1995 06 05 1995 06 06 1995 06 07 1995 06 08 1995 06 09 1995 06 10 1995 06 11 1995 06 12 1995 06 13 1995 06 14 1995 06 15 1995 06 16 1995 06 17 1995 06 18 1995 06 19 1995 06 20 1995 06 21 1995 06 22 1995 06 23 1995 06 24 1995 06 25 1995 06 26 1995 06 27 1995 06 28 1995 06 29 1995 06 30 1995 07 01 1995 07 02 1995 07 03 1995 07 04 1995 07 05 1995 07 06 1995 07 07 1995 07 08 1995 07 09 1995 07 10 1995 07 11 1995 07 12 1995 07 13 1995 07 14 1995 07 15 1995 07 16 1995 07 17 1995 07 18 1995 07 19 1995 07 20 1995 07 21 1995 07 22 1995 07 23 1995 07 24 1995 07 25 1995 07 26 1995 07 27 1995 07 28 1995 07 29 1995 07 30 1995 07 31 1995 08 01 1995 08 02 1995 08 03 1995 08 04 1995 08 05 1995 08 06 1995 08 07 1995 08 08 1995 08 09 1995 08 10 1995 08 11 1995 08 12 1995 08 13 1995 08 14 1995 08 15 1995 08 16 1995 08 17 1995 08 18 1995 08 19 1995 08 20 1995 08 21 1995 08 22 1995 08 23 1995 08 24 1995 08 25 1995 08 26 1995 08 27 1995 08 28 1995 08 29 1995 08 30 1995 08 31 1995 09 01 1995 09 02 1995 09 03 1995 09 04 1995 09 05 1995 09 06 1995 09 07 1995 09 08 1995 09 09 1995 09 10 1995 09 11 1995 09 12 1995 09 13 1995 09 14 1995 09 15 1995 09 16 1995 09 17 1995 09 18 1995 09 19 1995 09 20 1995 09 21 1995 09 22 1995 09 23 1995 09 24 1995 09 25 1995 09 26 1995 09 27 1995 09 28 1995 09 29 1995 09 30 1995 10 01 1995 10 02 1995 10 03 1995 10 04 1995 10 05 1995 10 06 1995 10 07 1995 10 08 1995 10 09 1995 10 10 1995 10 11 1995 10 12 1995 10 13 1995 10 14 1995 10 15 1995 10 16 1995 10 17 1995 10 18 1995 10 19 1995 10 20 1995 10 21 1995 10 22 1995 10 23 1995 10 24 1995 10 25 1995 10 26 1995 10 27 1995 10 28 1995 10 29 1995 10 30 1995 10 31 1995 11 01 1995 11 02 1995 11 03 1995 11 04 1995 11 05 1995 11 06 1995 11 07 1995 11 08 1995 11 09 1995 11 10 1995 11 11 1995 11 12 1995 11 13 1995 11 14 1995 11 15 1995 11 16 1995 11 17 1995 11 18 1995 11 19 1995 11 20 1995 11 21 1995 11 22 1995 11 23 1995 11 24 1995 11 25 1995 11 26 1995 11 27 1995 11 28 1995 11 29 1995 11 30 1995 12 01 1995 12 02 1995 12 03 1995 12 04 1995 12 05 1995 12 06 1995 12 07 1995 12 08 1995 12 09 1995 12 10 1995 12 11 1995 12 12 1995 12 13 1995 12 14 1995 12 15 1995 12 16 1995 12 17 1995 12 18 1995 12 19 1995 12 20 1995 12 21 1995 12 22 1995 12 23 1995 12 24 1995 12 25 1995 12 26 1995 12 27 1995 12 28 1995 12 29 1995 12 30 1995 12 31 1996 01 01 1996 01 02 1996 01 03 1996 01 04 1996 01 05 1996 01 06 19

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

The "Cognitive" Characteristics are similar, except of course, for the


1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100



[illegible]

ABCDEFGHI
abc defghi
123456789
+ = % ' / & , .

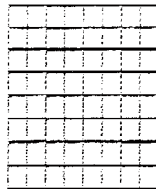
FONTMAKER © BOB MITCHELL 1985
12345678



15680 A

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ  
abcdefghijklmnopqrstuvwxyz  
0123456789-!@#$%^&*()~`|'";  
+={}/?.,
```

```
ENTER row+col+B/W eg: CBB
I B=Mark W=space J
N=(enter character)
B=(store/skip)
```



```

ABCDEFGHIJKLMN O PQRSTU VWX YZ
abcdefghijklmnopqrstuvwxyz
1234567890 !@#$%^&'()*~+-=

```

```

Character?
OUT = SAVE font; IN = LOAD font

```

This program lets you design your own character sets or fonts. Type it in and RUN it.

When the grid appears, select characters one by one and redefine them to your own specifications. Follow the prompts at the bottom of the screen.

N will poke the character into memory; if you want to skip over the character you have been working on, S will cancel it out and let you start again.

S also gives you the choice of quitting the program.

Variable loc is the address where your character set starts but you may change this using an address which is a multiple of 256. Line 35 calls the machine code routine which copies the ROM character set to loc. If you change the value of loc, you must also change the POKES at lines 787 and 740 to a value (loc/256)-1.

Saving and loading fonts is by OUT and IN on keys O and I.

Two examples of the screen are shown: the first is what you get when you start with the letter A; the second is an example cyrillic (Russian) alphabet which shows the expansion possibilities for printing on your TS2068.

TO MAKE A PROGRAM LISTING "DISAPPEAR" (ZX81)

Programs can be made to "disappear" if the following POKE is put into the program.

POKE 16509,64

Such "invisible" programs can be SAVE'd and LOAD'd as usual, and will RUN if address 16509 is reset to it's original value.

PEREIRA
Zebras Disk Drive
by
Don Lindhorst

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One word describes this system FANTASTIC! This is the drive made in Portugal by you know who it. Seems they don't want their name associated with computers anymore. Big deal as long as companies like Zebra are around to help us die hearts. This system uses no memory what so ever. There is a 4K ROM and 1K RAM in the interface that is switched in just like the Exrom is. This then send the messages to the controller. Inside the controller there is a 128 micro-processor, 2K boot ROM and 16K RAM that operate the disk drive. That's enough technical details.

With the system you get a disk full of programs and utilities. The controller has two RS232 serial interfaces and the disk included with the drive has the printer LLIST and LPRINT utilities along with disk backup and some others. So if you have a serial printer you save the cost of a interface about \$80.00.

How hard is it to use? Just as easy as a tape recorder. All you add is an "*" behind the key word eg. SAVE "*"tasword2" LINE 1 as simple as that. All those commands that we had no use for now we do. ERASE, FORMAT, CAT, MOVE, and lots more. There are absolutely no USB calls. Put a disk in the drive turn it on and away you go. There is 38 new error messages which really make it easy to tell what you did wrong.

It uses 3" compact floppy disks which are designed to be used on both sides giving you a total 280K of user storage. They advertise 320K but on each side of the disk 20K is used to store the operating system. This is done when you FORMAT the disk.

One final thing I purchased this system from ENC and it's been nothing but a headache (doing business with ENC not the disk drive). ENC does not deliver what it promises. When the system arrived just before Christmas it didn't work! I called Bob Dyl and he said to bad, call Zebra. They do the warranty work. I had to send it back to Zebra and they fixed it. They say it was not one of the units they sold to Bob Dyl but they repaired it anyways. Bob turns out to be a very undesirable person to do business with. He stopped taking my calls and refuses to send me a receipt for my purchases and the money he owes me. I now have the Postmaster in Newport, Rhode Island trying to help me solve this problem. From now on I will do all my business with Zebra Systems.

I could go on for ever but I will stop for now and if you want more info please feel free to write me.

TS2068 TAPE BUG
By Eric Michaud

While recently trying to figure out how to save some variables in a program I was working on, I came across an interesting bug in the 2068 ROM.

Try typing SAVE, and then pressing ENTER 9 times. After you press ENTER the ninth time some colourful blocks will appear on the screen, followed by some random dots, and finally the system will reset.

This crash also occurs with LOAD, MERGE, and VERIFY. Can anyone explain why this happens? This "bug" poses a potential danger if you are working on program that uses a lot of tape commands, so beware!!

ZX81 LOADING FILTER/INTERFACE

by Steven Pocock

This article describes how to construct a loading filter which will improve the signal characteristics of your tape recorder, permitting the use of fast loading programs such as ZXLR-8, FASTLOAD, and QSAVE, as well as regular loading.

All of the parts needed to make a this interface can be purchased at a good electronics parts distributor. When purchasing the parts do not deviate from the values listed, as tolerances and values are critical.

Place all components on the non-foil side of the board (component side) using diagram 2 as a guide. In order to reduce the amount of wiring that must be undertaken, insert the components so that the leads are adjacent to each other, therefore when they have to be connected, a solder bridge between the leads will suffice:

Example: Insert R6, R3, and C5 in consecutive holes, count off the number of spaces down and over and insert the other leads. Solder the leads to the copper eyelets (on the foil side) then put a solder bridge between the leads to connect the three components at the top. The other leads of R3 and C5 are connected with a solder bridge to C1.

I found assembly easier if all of the components were first placed and positioned (on the component side), then flip the board over (diagram 1, foil side) and solder the leads to the copper eyelets ensuring leads are adjacent to one another where necessary. Then make the necessary solder bridge connections. These connections are depicted as the thin lines joining the large dots in diagram 1. Then solder the solid wire connections onto the board. These are depicted as heavy black lines. Then use cutters to trim the excess component leads.

When installing components use as little heat as possible. Ensure correct polarity on C1, C2, C3, and C6. Solder in the IC socket but do not install the IC until everything else has been completed. Check all connections i.e. leads to eyelets, leads to leads and solder bridge connections.

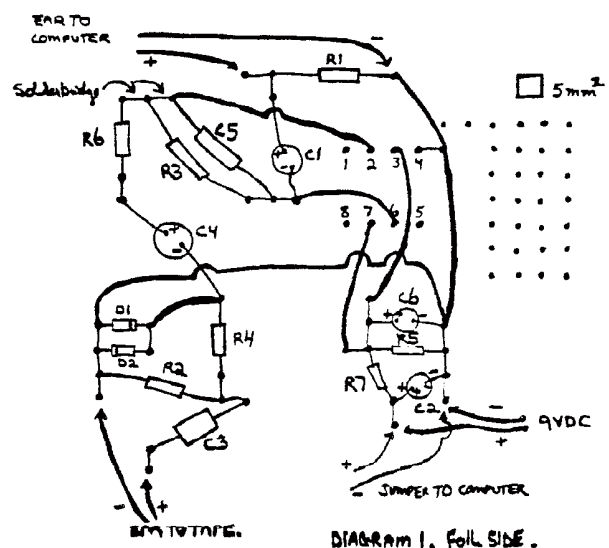
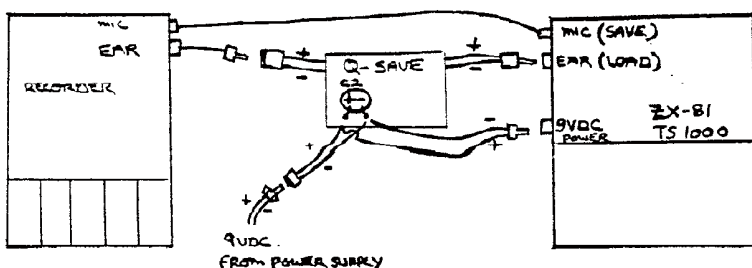
Now the board is complete. Because of its small size it can be easily mounted inside most cabinets. If the computer is in its original case then the filter should be attached externally, using jacks. Shielded audio cable is recommended for hookup, but I have used 27-gauge strand wire and have no interference problems.

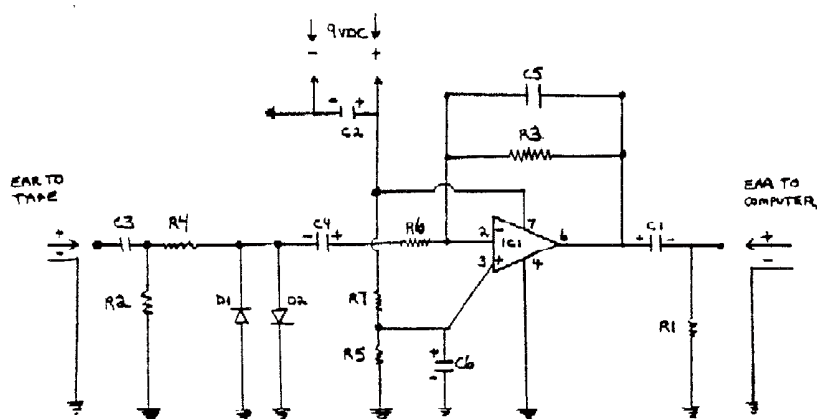
Cut two 4" lengths of shielded cable, attach a female plug to one length, and a male plug to the other. Attach the female plug and wire to the "ear to tape" location on the foil side of the filter; i.e. positive to C3, negative to ground.

Next connect the male plug and wire to the "ear to computer" location on the foil side of the board i.e. positive lead to the positive side of R1, negative lead to ground.

The 9V DC power line is connected in a similar fashion. Cut four pieces of 4" 27-gauge wire 2 black, 2 white. Attach a black (-) and a white (+) to wire to both the male and the female jacks. Attach both negative leads to the negative side of C2, and attach the positive leads to the positive side of C2. Your power adapter from the wall plugs into the female lead to provide power for the filter and the male plug plugs into the power port on the computer to provide it with power.

Now again check all solder points, plug the IC in, noting the correct orientation. The dot in the top indicates pin 1. Hook up the unit to your tape player and computer. The filter can also be hard-wired to your computer, first place it in your cabinet and make the connections described above, without wiring in plugs or jacks.





PARTS LIST

ITEM	CODE	QUANTITY	DESCRIPTION/TYPE
RESISTORS	R1,R2	2	10K
	R3	1	100K All resistors
	R4	1	4.7K 1/4 watt,
	R5	1	39K 5 percent
	R6,R7	2	33K tolerance
	D1,D2	2	1N914
	IC 1	1	741N or 741CN
	C1,C4	2	Note 1
	C5	2	Note 2
	C2,C6	1	Note 3
MISC.	C3	1	Note 4
		1	Note 5
		1	Note 6
OPTIONAL		2 feet	Note 7
		2	Note 8
		2	Note 9
		1	Case

SUBROUTINE TO ALIGN DECIMAL POINTS (ZX81)

Subroutine:

```

3000 PRINT " " (1 to M-(V>1)*INT(LN
V/LN 10)+(V<.1));V
3010 RETURN

```

Demonstration program:

```

10 LET M = 7
20 INPUT V
30 PRINT TAB 10
40 GOSUB 3000
50 LET V = V*10 * RND
60 GOTO 30

```

where:

V = Number to be printed
M = sets field width i.e. No of printing positions before the decimal point
N = Number of digits before the decimal point

The number of spaces put into line 3000 needs to be sufficient to handle the longest number; i.e. on the left side of the decimal point.

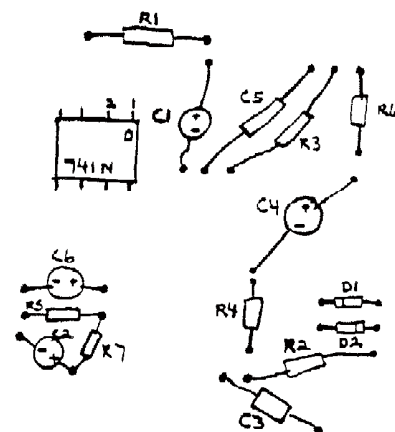


Diagram 2 Component list

NOTES:

- 6.8uf electrolytic or tantulum- any voltage (20V)
- 120 pf non electrolytic 10 percent tol. 120v
- 47uf electrolytic (16-25V)
- 0.01uf (10 mf) polystyrene or equivalent, 2 percent tolerance
- 8-pin D.I.P. socket
- P.C. board 4.5cm x 4.5cm Radio Shack #276-148 \$1.50
- 27 guage solid wire, black, white
- male jacks-----Radio Shack #274-283 \$2.9
- female jacks " " "

SUBROUTINE TO LIMIT THE NUMBER OF DIGITS PRINTED AFTER THE DECIMAL POINT (ZX81)

The subroutine:

```

1000 LET DIG = 10**N
1010 PRINT INT(V*DIG)/DIG;
1020 RETURN

```

A demonstration program:

```

10 FOR N = 1 TO 10
20 LET V = RND
30 PRINT "DIGITS =" ;N;TAB 15;
40 GOSUB 1000
50 PRINT
60 NEXT N
70 STOP

```

Where:

V = number to be printed
N = max. no. of digits to follow decimal point

The demo program simply generates a series of random numbers by the subroutine

This subroutine truncates the number. If you are happier with "rounding" the number then convert LINE 1010 to read:

```

1010 PRINT INT(V* DIG+.5)/DIG

```

LARKEN DISK DRIVES
by Peter Hacksel

This is not another review of the Larken Drive but rather the start of a new column especially designed for users of the Larken Drive System. More and more people have been purchasing a drive controller card from Larry Kenney. (The "Uncle Clive" of the disk drive world) It seems that the most common question that I get about the system is "If I buy the board what will I need and how can I set it up." So I thought it fitting to start my series of articles with a detailed explanation of how exactly to set up the Larken Disk Drive.

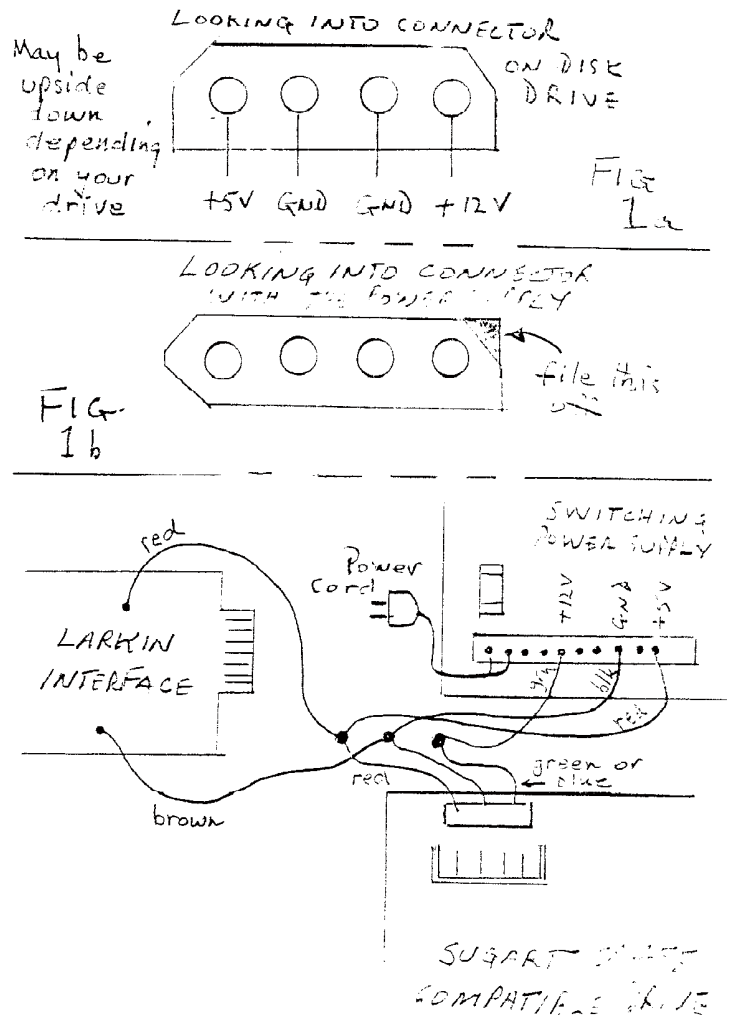
The system comes with only a controller card. The actual disk drive is not supplied. The controller card is what allows an IBM type disk drive to be used with the TS2068. So this means that you will have to buy a disk drive for yourself. The specific drive that the Larken board is designed to use is called a Shugart SA455. There are many different brands that may be used as long as they are compatible to the Shugart SA455. Ask the dealer to help you in this matter.

The second problem you will encounter is that most disk drives are sold uncased and have no power supply. Getting the case is simple enough. Most places that carry disk drives will also carry disk drive cases and they are all a standard size. However the power supply is a little more complex. A disk drive requires a fair bit of current to operate and the voltage must be very accurate to ensure that the drive will be reliable. For that reason a simple power supply such as the one that comes with the 2068 will definitely not be sufficient. What is needed is a Regulated power supply with both +5V and +12V supplied. "Regulated" simply means that the voltage is held at a particular very accurate voltage. Larry has included a schematic that allows you to make your own regulated power supply however I don't really see the point in doing this as they are rather cheap to buy. If you enjoy building though, then you are all set.

If on the other hand you are like myself and just want to get the thing working then there are several places that you may get a power supply. The best deal I have seen is at PARTS GALORE on Queen St. (About 2 blocks west of University Ave on the south side.) They have a mountainous stack of disk drive power supplies there and they cost a reasonable \$21.50 CDN. They also have a Shugart SA455 compatible drive for \$165.00 CDN and may have disk drive cases. Another advantage of buying this power supply is that it is the one that I am now going to show in detail, how to set up.

The board comes with a power cord and a white plastic connector that plugs into the disk drive. There are a few things that must first be done before you may plug it in. Firstly, The connector was not designed for this drive and will need to be filed to fit (See fig 1). Larry supplied me with a connector

that already fit but I don't know if he still does that anymore. In any case it is not only the disk drive that you will need to power but also the controller card. That is the purpose of the 2 wires sticking out of the controller card. These wires will have to be joined to the wires giving power to the drive (see fig 2). The connections may be done using crimp connectors. You will notice that the power supply has four and not three wires, as shown in the diagram. The yellow one supplies -12V and as that is not necessary for the drive it should be removed. Also make sure that the wires that I have shown coming from the board are actually in the places I have shown. If not make sure to change them. It is also important that the green and red wires are on their respective sides of the connector going into the disk drive. The connector is beveled so that it will only go in one way. (The results would be disastrous if they are wrong.) Once this is done simply connect the ribbon cables as is shown in the instructions that are supplied with the interface. Then DON'T Power up yet. Check your wiring thoroughly. And again. You probably will be impatient to see it running but if you do something wrong then you may just blow up \$500.00 worth of computer equipment at a flick of a switch. So be patient and check it properly before turning your power on. And that's it. You are ready to go!



Larry has announced a few additions that should come out in the near future. First is the addition of a facility for using two drives with his system. The second thing which he has had successfully running, is a cartridge that will do the same thing as George C.'s endless loop tape. For those who aren't familiar with this cartridge idea; when the machine is turned on, if you have the cartridge in the cartridge port then the computer will automatically load a special program called "AUTO.B1" and this can contain a program that has a menu that will allow you to load a program from a single keypress! Also in the works, perhaps the most exciting thing is an auto save board. This board will fit on the rear edge connector and will have a button on it. At any time this button is pressed, the entire contents of Ram will be saved to disk. This will allow any program to be saved, even the tricky programs with anti-piracy techniques being used. Simply load your program from tape, press a button and presto! Your program is saved. It can also be used for games that can't be saved half way through. For example you could be flying your plane at 1200 knots in a Kamakazi dive, push the button and the program will save to disk. The next day when you load the program it will reload with you in the same predicament! Unfortunately Larry does not seem to think that this is such a high priority and if you feel as excited about this as I am then let him know. If enough people mention it maybe he will put it higher on his list of priorities. Last but not least I have come up with an easier way to save machine code. Rather than enter the program to poke the numbers for the starting address and length, Try this:

```

1 LET START=xxxxx
2 LET LENGTH=xxxxx
3 RANDOMIZE START: POKE 23540,PEEK 23670:
  POKE 23541, PEEK 23671
4 RANDOMIZE LENGTH: POKE 23542,PEEK 23670:
  POKE 23543, PEEK 23671
5 OUT 84,64:PRINT USR 63488:REM SAVE
  "nnnnnn.C1"

```

QL TIPS

ALL CAPITALS

To force the QL to accept all input in CAPITAL LETTERS (AND DO ALL SUCCESSIVE PRINTING IN capitals as well) include the following POKE as part of your program:

```
POKE 163976,255
```

POKEing the same address with zero resets the machine to lower case mode.

When you want to put a color command into a line so that it will be printed on screen in a color, you do not have to use the INK command.

Instead, you can imbed the color command in the line itself by using the "CAPS/SHIFT" and the "SYMBOL/SHIFT" together to enter the extended mode. Then hold down the "CAPS/SHIFT" and press the key representing the color of your choice.

This will imbed the color command just in front of the character that is to print in color. Then continue typing the characters until you are ready to change back to black. Then go into the extended mode again and, while holding down the "CAPS/SHIFT" key again, press the black key (0). This returns you to the ordinary way of black letters again.

Be sure to turn off the command at the end of the section you want to have in color. If you don't, the command will affect all characters following. It must be turned off.

You can change the "PAPER" colors in a similar way by entering extended mode and not holding down the shift key when selecting your color from the top row of the keyboard. Again, you must return to your normal color (usually WHITE '7'), or the rest of your program will be affected.

This is an interesting way to set off your REM statements so that they are eye-grabbers on your screen.

No space will be taken for the command in the line, but you will see the cursor change color and everything that you type will be affected.

This article was reprinted from the TAS 8AM Users Group newsletter KEYBOARDS Vol.4 No.1 Jan/Feb 1986

PROCEDURE CRASH

Do not use the names of previously defined procedures and functions that have been deleted since power on, in programs and direct commands, before the machine has been RESET. A bug in the QL's ROM will cause the machine to crash, should you attempt to do so.

A program containing such keywords can be saved and the machine RESET, whereupon everything will work as expected again.

REVIEW
Omni-EMU
by
Don Lindhorst

I ordered an emulator from the English Micro Connection. The price from different dealers ranges from \$35 to \$45 US. Its like buying a second computer.

I purchased the Omni-EMU because I am not into opening up my computer. It just slips into the cartridge port and it doesn't have to be removed as it has a switch on board to switch back and forth between 2068 and Spectrum mode. The 2068 must be turned off to change modes.

The only short coming is that it is an open board. If it could be enclosed like the command cartridges it would be perfect. I have ordered the Zebra emulator (\$19.95 US.). It is a command cartridge made for the Portuguese 2068 and modified for the American 2068. I will report on it later as it is not supposed to run as many programs as the Omni-EMU. By the way the Omni-Emu is supposed to run 99.99% of the Spectrum programs. If anyone has a program that won't work with their emulator send it to me I'll see if it works on the Omni-EMU.

The Omni came with no documentation but fit neatly in the cartridge port. I have a subscription to Spectrum Computing which is a monthly magazine on tape. The programs don't run on the 2068 but with the emulator I had no problems.

If you don't want to open up your 2068 this is one of the ways to go. There are a couple of new emulator/Spectrum buss combinations that plug into the back of the 2068 and leave the cartridge port free for other cartridges.

REVIEW
Zebra Systems Spectrum Emulator
Cartridge
by
Don Lindhorst

This emulator looks just like a Timex Command Cartridge and fits in the slot at the right of the computer. The big surprise is the price \$19.95 US. So far it has run every program my Omni-EMU has. It is easier to use than the Omni-EMU because you just leave it in the cartridge slot and access it through the OUT command. OUT 244,3 gets you Spectrum mode and OUT 244,0 : NEW gets you back to 2068 mode. Whats really nice is that you don't have to keep turning the 2068 off and on all the time. So far I prefer this emulator over the Omni-EMU.

PEEKs AND POKEs
for the SPECTRUM
by Jim Dodrill
(Some will work on the TS2068)

POKE 23736,181
When SAVEing a multi-part program insert POKE 23736,181 between SAVE statements, and the computer will then save all parts of the program without the "START TAPE" prompt.
example: 9999 SAVE "prog" LINE 10: POKE 23736,181:
SAVE "byte" CODE 64599,760

2068 & SPECTRUM CUSTOMIZED ROMs

If you have an EPROM burner and an emulator, you can replace both ROMs with modified versions. My 2068 has Cameron Hayne's tape to tape copying routine at 15582 and Olliger's NMI correction. My Spectrum has RENUMBER at 14555, Header Reader at 15237, and Tape to Tape at 15582. A USER call to the appropriate address activates the routine resident there. The Spectrum ROM has over 1100 bytes just crying to be stuffed with neat goodies. George Chambers has a tape with my version which you could easily modify to hold your own favourite routines.

Burn the 2068 ROM first following Olliger's instructions very carefully, and modify the computer board by adding the 74LS32 as he details. With the new EPROM plugged in, it is a very simple matter to burn the Spectrum ROM with this BASIC routine:

```
1 FOR I=0 TO 16384
2 POKE I, PEEK (I+32768)
3 PAUSE 3: PRINT AT 12,13;I
4 NEXT I
```

Replacing the ROMs on the emulator board with EPROMs requires a small modification to the board. The original version switches pin 27 of the socket to pin 27 of the active ROM. Change this so that pins 22 are switched instead. Cut the board tracks and solder the wires from the switch to them instead of the original pads. Leave pins 27 pulled high with the 10K resistors and pull pins 22 high with two more 10Ks.

Larry Crawford London Club

POKE 23756,0
Will change the first line of a program to LINE 0.

POKE 23692,255
This POKE will give auto SCROLL on long text programs.

QSAVE TECHNIQUES

by Steven Pocock

This article offers some suggestions on the use of fast loading/saving ZX81 programs using Q-SAVE software, based on my experience with it.

Power up and load the QSAVE software using the normal LOAD "". The 16K version sets itself above RANTOP while the 64K version will reside in the 8-16K area, safe from NEW and RESET. LOAD or type in a test program. To QSAVE the program, start the recorder on RECORD and enter RAND USR 32383 for the 16K or RAND USR 8683 for the 64K.

The screen SAVE pattern will be very different and the program should SAVE and LOAD 16 times faster. Once SAVED, rewind the tape. Because the filter is also an amplifier you'll probably have to turn down the volume on your tape deck. I used to load at 3/4 full volume (#3); now I load at 1/5 volume (#2). The volume setting is sensitive so you may have to attempt to verify the program a few times before the ideal volume setting is found. The VERIFY option will determine if your SAVE was good. To verify a program, enter PRINT USR 32377 for 16K, or PRINT USR 8677 for 64K, then start the tape.

If the program has been properly SAVED a V = 0 will appear in the top left hand side of the screen. If some other number appears, rewind the tape and try a different volume. Verify again. When V = 0 shows up, mark the volume position on the recorder for future reference.

<u>COMMANDS</u>	<u>16K</u>	<u>64K</u>
SAVE	RAND USR 32383	RAND USR 8683
LOAD	RAND USR 32371	RAND USR 8671
VERIFY	PRINT USR 32377	PRINT USR 8677

To make an Auto-run tape change your normal SAVE line to:

```
9000 RAND USR 32383 (or RAND USR 8683)
9010 SLOW
9020 GOTO START.
```

Certain programs are not this easy to convert to Auto-run with QSAVE.

If there is any machine code after the SAVE statement the new QSAVE statement must be modified so that the memory locations of the machine code are not changed, otherwise the program will crash. In order to do this the new SAVE statement must contain the same number of bytes as the old SAVE statement. The new statements will be 9 bytes long for 64K or 10 bytes long for 16K. Use RAND USR VAL "32383" (or RAND USR VAL "8683"). If the current SAVE statement has fewer than 9 or 10 bytes then some bytes will have to be removed in a line earlier in the program. Use the VAL function as described in the next paragraph to free up some bytes, and add spaces to 'pad' the program out.

If it has more than 9 or 10 bytes, then substitute RAND USR VAL "32383" (or RAND USR VAL "8683"), for the current SAVE line and add spaces so that the number of bytes in the old and new line are the same. Hidden spaces may have been put in the original SAVE statement. To check for hidden spaces press EDIT to put the line in EDIT mode, then use the cursor to step to the end of the line. If you can step past the last quote, then hidden spaces have been put into the line and they must be counted, and be included in the new QSAVE line.

A QSAVED program should always return in the SLOW mode. If it returns in the FAST mode you won't get a screen display and you will not be able to break out of the program.

In order to break an Auto-run program, hold down the BREAK key once the program has started to load, and the program will not Auto-run when loaded.

If you've entered RAND USR 32371 (or RAND USR 8671) to load a program and then changed your mind, pressing the BREAK key will not get you out of the LOAD mode. In order to get out, press the play key on your tape recorder to provide a signal, then press the BREAK key. This should get you out of the LOAD mode.

POKE 23617,14

When inserted before an INPUT statement this POKE will change the cursor to " - " and INPUT will be in CAPS.

POKE 23613,PEEK (23730)-5

When this POKE is used the BREAK key will be disabled, and the program will crash.

POKE 23755,100

When used at the beginning of a program, the program will not LIST.

POKE 23658,8

Will turn on CAPS LOCK

POKE 23658,0

Will turn off CAPS LOCK.

POKE 23561,20

Address 23561 stores the length of time a key is held down before it repeats (35 is the default value) Set at a lower value for fast typists.

LET t = USR 3582

Scrolls screen one line

LET t = USR 3583

Scrolls bottom half of screen one line.

LET t = USR 3330

Scrolls whole screen to top line. Must be followed by CLS.

From the Sinclair Louisville Users Group newsletter

PROGRAMMING TIPS - PART 3

Some beginning programmers tend to make an easy mistake with the TS1000: using SLOW when FAST is better. When is it better to use SLOW?

1. When moving graphics are used, especially with machine code.
2. For short interactive programs not necessarily using graphics.
3. When the screen blank-out and flickering of the FAST mode are undesirable.

When is FAST better?

1. When any major arithmetical computations are involved, particularly of the trigonometric, logarithmic, SQR, ABS, and other functions; anywhere that long equations are involved (which tends to exclude most games programs anyway!).

2. When editing - long programs in particular.

3. Most programs where appearance is unimportant: for example, most scientific and technical programs.

Let me give you some hard numbers.. Take this simple loop:

```
5 FOR F=1 TO 1000
10 NEXT F
```

In SLOW, execution time is 27.0 seconds. In FAST, it takes only 4.45 seconds. SLOW took over 6 times as long to do the same task. More timed examples are given in the September issue in "Programming Tips Part 1.". One involving a trigonometric function given there took 39.5 seconds to finish in SLOW, but only 6 seconds in FAST. SLOW took, once again, over 6 times as long.

SLOW can cause frustrations when editing. When moving the line cursor down to a given line down to edit it, the listing is reprinted from the top of the screen each time. In FAST, you don't have to watch it each time - and also while editing the line itself, since the line is reprinted on the bottom of the screen each time the K or L cursor is moved, there is a similar advantage to using FAST. So what if the screen flickers? Do your editing at home!

Something else that beginning programmers get confused about, is the use of PLOT coordinates vs PRINT coordinates.

PRINT AT 0,0;"X" will put the X in the upper left-hand corner of the screen. The PRINT positions are numbered from 0 to 23 down, and from 0 to 31 across. In a PRINT at A,B statement, A is the line number going down, and B is the print position going across.

PLOT 0,0 will blacken the pixel in the lower left-hand corner of the screen. The numbers here in PLOT and UNPLOT A,B run from 0 to 43 going up for A, and 0 to 63 going across for B. PLOT 43,63 will blacken the extreme upper right-hand pixel.

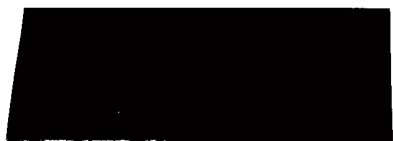
Ordinarily, you can't print on lines 23 and 24, the bottom two lines. Within a program, however, you can, by using the line POKE 16418,0, one of the first programming tricks ever discovered for the TS1000. You must POKE 16418 back to 2, it's original setting, before INPUTting anything, or the whole system will crash.

Taken from the Nov.1985 issue of the
Hampton Roads T/S User Group newsletter.

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